POINT-OF-VIEW

COMMENT ON THE GABBRO SOILS OF PINE HILL

Burge and Manos (2011) investigated the genetic relationships of *Ceanothus roderickii* W. Knight and *Ceanothus cuneatus* Nutt. var *cuneatus* and sampled surface soils where the plants were found. They claimed to have shown that the two species are associated with chemically different gabbro soils.

The mineralogical and chemical differences among gabbro rocks are great and plant distributions from those dominated by olivine to those dominated by Ca-feldspars might be expected to be different. With respect to *C. roderickii* and *C. cuneatus* var. *cuneatus*, there are three key questions: (1) What is the range of gabbro soils on which *C. roderickii* will grow? (2) What is the range of gabbro soils on which *C. cuneatus* var. *cuneatus* will grow? (3) Considering gabbro rocks and soils where the ranges of *C. roderickii* and *C. cuneatus* var. *cuneatus* do not overlap, what are the mineralogical differences in the rocks and the chemical differences in the soils that might limit plant distributions. A final test would be to plant the two species in soils from different kinds of gabbro rocks under climatically similar or controlled.

Burge and Manos (2011) did not identify the specific gabbro rock mineralogies; they sampled only surface soils, and they ascertained only the readily extractable portions of the chemical elements. Locations where they sampled surface soils may have been in areas where the distributions of *C. roderickii* and *C. cuneatus* var. *cuneatus* do not overlap, but the methods were not adequate to distinguish different kinds of rocks and soils. Their data indicate that the greatest differences between the surface soils at sites with different ceanothus species were different amounts of Mehlich III (dilute acids and EDTA) extractable P.

Alexander (2011) sampled the parent rocks and both surface (0–15 cm) and subsoils (30–45 cm) at one site with *C. roderickii* and two sites without it on the Pine Hill gabbro. Phosphorus was ascertained from aqua regia digestion of the soils to evaluate the total elemental reserves in the soils. The soil with *C. roderickii* had subsoil P similar to that in the other soils, but the surface soil in the *C. roderickii* plant community had much more P than in the surface soils at the sites lacking *C. roderickii*. The surface soil at the *C. roderickii* site also had much more organic matter than the soils at the other two sites. Evidently, the amounts of P in the surface soils was largely dependent on the amounts of plant detritus that had been incorporated into them, which is a function of entire ecosystems, not only a single species. Perhaps the soil parent materials at the *C. roderickii* sites where Burge and Manos sampled the surface soils had as much P as the parent materials of other gabbro soils, but the plant communities at *C. roderickii* sites were cycling less P than the plant communities at the wedgeleaf ceanothus sites?

Unfortunately, the methods of Alexander (2011) are too intensive to apply broadly and the low- intensive methods of Burge and Manos are inadequate to show gabbro petrologic and soil differences related to the distributions of endemic plants. Perhaps future investigations that are less intensive than that of Alexander, but comprehensive enough to identify the kinds of gabbro parent rocks and both surface and subsoil reserves of key elements, will identify what gabbro rock and soil features lead to different plant distributions.

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LITERATURE CITED

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